

Express Mail Label No.
EL 890729070US

103

Attorney Docket No.
SMX 3093.3 (99-100D1)

**POLYMER BRUSHES FOR IMMOBILIZING MOLECULES TO A SURFACE
AND HAVING WATER-SOLUBLE OR WATER-DISPERSIBLE SEGMENTS
THEREIN AND PROBES BONDED THERETO**

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ABSTRACT

Sensors for determining the presence and concentration of bio-molecules in a biological sample are provided in the form of polymer brushes, which comprise a substrate having a surface that is modified with a water-dispersible or water-soluble polymer segment having functional groups that bind probes. The method of synthesis of such sensors preferably includes use of controlled free radical polymerization techniques, and in particular the use of an iniferter initiator, which allows for controlled architecture polymers to modify the surface of the substrate. In this manner functional groups in the polymer chain are removed from the surface, which allows for solution chemistry to be more realistically reproduced with the benefits of a solid bound probe.

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